

Quiz**Name**

The power series $1 - x + x^2 - x^3 + x^4 - x^5 + x^6 - x^7 + \dots$ is known to converge to $\frac{1}{1+x}$ for all x with $|x| < 1$. Since the larger powers of x get smaller for such values of x , $\frac{1}{1+x} \approx 1 - x + x^2 - x^3 + x^4 - x^5$ for $0 \leq x \leq \frac{1}{2}$.

1. Use this fact to approximate $\int_0^{\frac{1}{2}} \frac{1}{1+x^4} dx$. (Round off your computations at three decimal places.)

2. Consider the specifics of your procedure and assess the accuracy of your approximation of the integral.